

SEQUENCE LISTING

<110> BARTOSCH et al.

<120> Infectious HCV pseudo-particles containing fonctionnal E1, E2 envelope proteins

<130> P08575US00/BAS

<140> US 10/527,422

<141> 2005-03-14

<150> PCT/IB2003/003882

<151> 2003-09-12

<160> 16

<170> PatentIn version 3.2

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<212> PRT

<213> Hepatitis C virus : delta C

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 (ClaI-blunted/StuI) in BamHI-blunted of hCMV-G

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 ttccagtttg gaacaagagt ccactattaa agaacgtgga ctccaacgtc aaagggcgaa 7080
 aaaccgtcta tcagggcgat ggcccactac gtgaaccatc accctaataca agtttttttg 7140
 ggtcgaggtg ccgtaaagca ctaaatcgga accctaaagg gagccccga tttagagctt 7200
 gacggggaaa gccggcgaa gtggcgagaa aggaagggaa gaaagcgaaa ggagcgggcg 7260
 ctagggcgct ggcaagtgtg gcggtcacgc tgcgcgtaac caccacacc gccgcgctta 7320
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 gatcgggtgcg ggctcttcg ctattacgcc agctggcgaa agggggatgt gctgcaaggc 7440
 gattaagttg ggtaaccca gggttttccc agtcacgacg ttgtaaaacg acggccagtg 7500
 agcgcgcgta atacgactca ctatagggcg aattggagct ccaccgcggt g 7551

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 <212> PRT
 <213> Artificial

<220>
 <223> delta CE E2p7 polyprotein

<400> 15

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Gly	Gly	Ala	Ala	Arg	Ala	Leu	Ala	His	Gly	Val	Arg	Val	Leu	Glu	Asp
		20						25					30		

Gly	Val	Asn	Tyr	Ala	Thr	Gly	Asn	Leu	Pro	Gly	Cys	Phe	Phe	Ser	Ile
		35					40					45			

Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
50 55 60

Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro
65 70 75 80

Asn Ser Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro
85 90 95

Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
100 105 110

Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
115 120 125

Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
130 135 140

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
145 150 155 160

Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Ser Cys
165 170 175

Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
180 185 190

Asp Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln
195 200 205

Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
210 215 220

Trp Gly Val Leu Ala Gly Ile Ala Tyr Phe Ser Met Val Gly Asn Trp
225 230 235 240

Ala Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu
245 250 255

Thr His Val Thr Gly Gly Ser Ala Gly His Thr Thr Ala Gly Leu Val
260 265 270

Gly Leu Leu Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr
 275 280 285

Asn Gly Ser Trp His Ile Asn Ser Thr Ala Leu Asn Cys Asn Asp Ser
 290 295 300

Leu Thr Thr Gly Trp Leu Ala Gly Leu Phe Tyr Arg His Lys Phe Asn
 305 310 315 320

Ser Ser Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp
 325 330 335

Phe Ala Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu
 340 345 350

Asp Glu Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile
 355 360 365

Val Pro Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser
 370 375 380

Pro Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser
 385 390 395 400

Trp Gly Ala Asn Asp Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro
 405 410 415

Pro Leu Gly Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe
 420 425 430

Thr Lys Val Cys Gly Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn
 435 440 445

Asn Thr Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys His Pro Glu Ala
 450 455 460

Thr Tyr Ser Arg Cys Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Met
 465 470 475 480

Val Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr
 485 490 495

Thr Ile Phe Lys Val Arg Met Tyr Val Gly Gly Val Glu His Arg Leu
500 505 510

Glu Ala Ala Cys Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp
515 520 525

Arg Asp Arg Ser Glu Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp
530 535 540

Gln Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly
545 550 555 560

Leu Ile His Leu His Gln Asn Ile Val Asp Val Gln Tyr Leu Tyr Gly
565 570 575

Val Gly Ser Ser Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val
580 585 590

Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp
595 600 605

Met Met Leu Leu Ile Ser Gln Ala Glu Ala Ala Leu Glu Asn Leu Val
610 615 620

Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe
625 630 635 640

Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly Arg Trp Val Pro
645 650 655

Gly Ala Val Tyr Ala Phe Tyr Gly Met Trp Pro Leu Leu Leu Leu Leu
660 665 670

Leu Ala Leu Pro Gln Arg Ala Tyr Ala Glx
675 680

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<211> 3011
<212> PRT
<213> Hepatitis C virus

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 <223> E2

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 <223> p7

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Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn
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Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
20 25 30

Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
35 40 45

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
50 55 60

Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
65 70 75 80

Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
85 90 95

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
100 105 110

Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys

115

120

125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
 130 135 140

Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
 180 185 190

Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro
 195 200 205

Asn Ser Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro
 210 215 220

Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
 225 230 235 240

Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
 245 250 255

Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
 275 280 285

Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320

Asp Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln
 325 330 335

Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
 340 345 350

Trp Gly Val Leu Ala Gly Ile Ala Tyr Phe Ser Met Val Gly Asn Trp
355 360 365

Ala Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu
370 375 380

Thr His Val Thr Gly Gly Ser Ala Gly Arg Thr Thr Ala Gly Leu Val
385 390 395 400

Gly Leu Leu Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr
405 410 415

Asn Gly Ser Trp His Ile Asn Ser Thr Ala Leu Asn Cys Asn Glu Ser
420 425 430

Leu Asn Thr Gly Trp Leu Ala Gly Leu Phe Tyr Gln His Lys Phe Asn
435 440 445

Ser Ser Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp
450 455 460

Phe Ala Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu
465 470 475 480

Asp Glu Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile
485 490 495

Val Pro Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser
500 505 510

Pro Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser
515 520 525

Trp Gly Ala Asn Asp Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro
530 535 540

Pro Leu Gly Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe
545 550 555 560

Thr Lys Val Cys Gly Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn
565 570 575

Asn Thr Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys His Pro Glu Ala
580 585 590

Thr Tyr Ser Arg Cys Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Met
595 600 605

Val Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr
610 615 620

Thr Ile Phe Lys Val Arg Met Tyr Val Gly Gly Val Glu His Arg Leu
625 630 635 640

Glu Ala Ala Cys Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp
645 650 655

Arg Asp Arg Ser Glu Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp
660 665 670

Gln Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly
675 680 685

Leu Ile His Leu His Gln Asn Ile Val Asp Val Gln Tyr Leu Tyr Gly
690 695 700

Val Gly Ser Ser Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val
705 710 715 720

Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp
725 730 735

Met Met Leu Leu Ile Ser Gln Ala Glu Ala Ala Leu Glu Asn Leu Val
740 745 750

Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe
755 760 765

Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly Arg Trp Val Pro
770 775 780

Gly Ala Val Tyr Ala Phe Tyr Gly Met Trp Pro Leu Leu Leu Leu Leu
785 790 795 800

Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr Glu Val Ala Ala
805 810 815

Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala Leu Thr Leu Ser
820 825 830

Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp Trp Leu Gln Tyr
835 840 845

Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp Val Pro Pro Leu
850 855 860

Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu Met Cys Val Val
865 870 875 880

His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe
885 890 895

Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys Val Pro Tyr Phe
900 905 910

Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu Ala Arg Lys Ile
915 920 925

Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys Leu Gly Ala Leu
930 935 940

Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala
945 950 955 960

His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe
965 970 975

Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala
980 985 990

Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Gln
995 1000 1005

Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp
1010 1015 1020

Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly

1025		1030		1035
Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn				
1040		1045		1050
Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr				
1055		1060		1065
Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His				
1070		1075		1080
Gly Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile				
1085		1090		1095
Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala				
1100		1105		1110
Pro Gln Gly Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser				
1115		1120		1125
Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg				
1130		1135		1140
Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile				
1145		1150		1155
Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ala				
1160		1165		1170
Gly His Ala Val Gly Leu Phe Arg Ala Ala Val Cys Thr Arg Gly				
1175		1180		1185
Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu Thr				
1190		1195		1200
Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Ala				
1205		1210		1215
Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly				
1220		1225		1230
Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly				

1235		1240		1245
Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly	1250	1255		1260
Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile	1265	1270		1275
Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr	1280	1285		1290
Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly	1295	1300		1305
Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala	1310	1315		1320
Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr	1325	1330		1335
Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	1340	1345		1350
Ser Val Thr Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser	1355	1360		1365
Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu	1370	1375		1380
Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys	1385	1390		1395
Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn	1400	1405		1410
Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr	1415	1420		1425
Ser Gly Asp Val Val Val Val Ser Thr Asp Ala Leu Met Thr Gly	1430	1435		1440
Phe Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val	1445	1450		1455

Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu
1460 1465 1470

Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg
1475 1480 1485

Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala
1490 1495 1500

Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys
1505 1510 1515

Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala
1520 1525 1530

Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu
1535 1540 1545

Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr
1550 1555 1560

Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln
1565 1570 1575

Ser Gly Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val
1580 1585 1590

Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp
1595 1600 1605

Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro
1610 1615 1620

Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Leu Thr
1625 1630 1635

His Pro Ile Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp Leu
1640 1645 1650

Glu Val Val Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala
1655 1660 1665

Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val	Ile	Val
1670						1675					1680			
Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg
1685						1690					1695			
Glu	Val	Leu	Tyr	Gln	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser	Gln
1700						1705					1710			
His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	Met	Met	Leu	Ala	Glu	Gln	Phe
1715						1720					1725			
Lys	Gln	Lys	Ala	Leu	Gly	Leu	Leu	Gln	Thr	Ala	Ser	Arg	Gln	Ala
1730						1735					1740			
Glu	Val	Ile	Thr	Pro	Ala	Val	Gln	Thr	Asn	Trp	Gln	Lys	Leu	Glu
1745						1750					1755			
Val	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	Ser	Gly	Ile	Gln
1760						1765					1770			
Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	Ala	Ile	Ala
1775						1780					1785			
Ser	Leu	Met	Ala	Phe	Thr	Ala	Ala	Val	Thr	Ser	Pro	Leu	Thr	Thr
1790						1795					1800			
Gly	Gln	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	Ala
1805						1810					1815			
Gln	Leu	Ala	Ala	Pro	Gly	Ala	Ala	Thr	Ala	Phe	Val	Gly	Ala	Gly
1820						1825					1830			
Leu	Ala	Gly	Ala	Ala	Ile	Gly	Ser	Val	Gly	Leu	Gly	Lys	Val	Leu
1835						1840					1845			
Val	Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu
1850						1855					1860			
Val	Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu	Val	Pro	Ser	Thr	Glu	Asp
1865						1870					1875			

Leu Val 1880	Asn Leu Leu Pro 1885	Ala Ile Leu Ser Pro 1890	Gly Ala Leu Val
Val Gly 1895	Val Val Cys Ala 1900	Ile Leu Arg Arg 1905	His Val Gly Pro
Gly Glu 1910	Gly Ala Val Gln Trp 1915	Met Asn Arg Leu Ile 1920	Ala Phe Ala
Ser Arg 1925	Gly Asn His Val Ser 1930	Pro Thr His Tyr Val 1935	Pro Glu Ser
Asp Ala 1940	Ala Ala Arg Val Thr 1945	Ala Ile Leu Ser Ser 1950	Leu Thr Val
Thr Gln 1955	Leu Leu Arg Arg Leu 1960	His Gln Trp Ile Ser 1965	Ser Glu Cys
Thr Thr 1970	Pro Cys Ser Gly Ser 1975	Trp Leu Arg Asp Ile 1980	Trp Asp Trp
Ile Cys 1985	Glu Val Leu Ser Asp 1990	Phe Lys Thr Trp Leu 1995	Lys Ala Lys
Leu Met 2000	Pro Gln Leu Pro Gly 2005	Ile Pro Phe Val Ser 2010	Cys Gln Arg
Gly Tyr 2015	Arg Gly Val Trp Arg 2020	Gly Asp Gly Ile Met 2025	His Thr Arg
Cys His 2030	Cys Gly Ala Glu Ile 2035	Thr Gly His Val Lys 2040	Asn Gly Thr
Met Arg 2045	Ile Val Gly Pro Arg 2050	Thr Cys Arg Asn Met 2055	Trp Ser Gly
Thr Phe 2060	Pro Ile Asn Ala Tyr 2065	Thr Thr Gly Pro Cys 2070	Thr Pro Leu
Pro Ala 2075	Pro Asn Tyr Lys Phe 2080	Ala Leu Trp Arg Val 2085	Ser Ala Glu
Glu Tyr	Val Glu Ile Arg Arg	Val Gly Asp Phe His	Tyr Val Ser

2090		2095		2100
Gly Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser	2105	2110		2115
Pro Glu Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His Arg Phe	2120	2125		2130
Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe Arg	2135	2140		2145
Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu	2150	2155		2160
Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro	2165	2170		2175
Ser His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly	2180	2185		2190
Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala	2195	2200		2205
Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp	2210	2215		2220
Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly	2225	2230		2235
Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile Leu	2240	2245		2250
Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val	2255	2260		2265
Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg	2270	2275		2280
Ala Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val	2285	2290		2295
Glu Thr Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly	2300	2305		2310

Cys	Pro	Leu	Pro	Pro	Pro	Arg	Ser	Pro	Pro	Val	Pro	Pro	Pro	Arg
2315						2320					2325			
Lys	Lys	Arg	Thr	Val	Val	Leu	Thr	Glu	Ser	Thr	Leu	Ser	Thr	Ala
2330						2335					2340			
Leu	Ala	Glu	Leu	Ala	Thr	Lys	Ser	Phe	Gly	Ser	Ser	Ser	Thr	Ser
2345						2350					2355			
Gly	Ile	Thr	Gly	Asp	Asn	Thr	Thr	Thr	Ser	Ser	Glu	Pro	Ala	Pro
2360						2365					2370			
Ser	Gly	Cys	Pro	Pro	Asp	Ser	Asp	Val	Glu	Ser	Tyr	Ser	Ser	Met
2375						2380					2385			
Pro	Pro	Leu	Glu	Gly	Glu	Pro	Gly	Asp	Pro	Asp	Leu	Ser	Asp	Gly
2390						2395					2400			
Ser	Trp	Ser	Thr	Val	Ser	Ser	Gly	Ala	Asp	Thr	Glu	Asp	Val	Val
2405						2410					2415			
Cys	Cys	Ser	Met	Ser	Tyr	Ser	Trp	Thr	Gly	Ala	Leu	Val	Thr	Pro
2420						2425					2430			
Cys	Ala	Ala	Glu	Glu	Gln	Lys	Leu	Pro	Ile	Asn	Ala	Leu	Ser	Asn
2435						2440					2445			
Ser	Leu	Leu	Arg	His	His	Asn	Leu	Val	Tyr	Ser	Thr	Thr	Ser	Arg
2450						2455					2460			
Ser	Ala	Cys	Gln	Arg	Gln	Lys	Lys	Val	Thr	Phe	Asp	Arg	Leu	Gln
2465						2470					2475			
Val	Leu	Asp	Ser	His	Tyr	Gln	Asp	Val	Leu	Lys	Glu	Val	Lys	Ala
2480						2485					2490			
Ala	Ala	Ser	Lys	Val	Lys	Ala	Asn	Leu	Leu	Ser	Val	Glu	Glu	Ala
2495						2500					2505			
Cys	Ser	Leu	Thr	Pro	Pro	His	Ser	Ala	Lys	Ser	Lys	Phe	Gly	Tyr
2510						2515					2520			

Gly	Ala	Lys	Asp	Val	Arg	Cys	His	Ala	Arg	Lys	Ala	Val	Ala	His
2525						2530					2535			
Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu	Glu	Asp	Ser	Val	Thr	Pro
2540						2545					2550			
Ile	Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu	Val	Phe	Cys	Val	Gln
2555						2560					2565			
Pro	Glu	Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro
2570						2575					2580			
Asp	Leu	Gly	Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val
2585						2590					2595			
Val	Ser	Lys	Leu	Pro	Leu	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe
2600						2605					2610			
Gln	Tyr	Ser	Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala	Trp
2615						2620					2625			
Lys	Ser	Lys	Lys	Thr	Pro	Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys
2630						2635					2640			
Phe	Asp	Ser	Thr	Val	Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala
2645						2650					2655			
Ile	Tyr	Gln	Cys	Cys	Asp	Leu	Asp	Pro	Gln	Ala	Arg	Val	Ala	Ile
2660						2665					2670			
Lys	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Val	Gly	Gly	Pro	Leu	Thr	Asn
2675						2680					2685			
Ser	Arg	Gly	Glu	Asn	Cys	Gly	Tyr	Arg	Arg	Cys	Arg	Ala	Ser	Gly
2690						2695					2700			
Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	Leu	Thr	Cys	Tyr	Ile	Lys
2705						2710					2715			
Ala	Arg	Ala	Ala	Cys	Arg	Ala	Ala	Gly	Leu	Gln	Asp	Cys	Thr	Met
2720						2725					2730			

Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly
2735 2740 2745

Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met
2750 2755 2760

Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr
2765 2770 2775

Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala
2780 2785 2790

His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro
2795 2800 2805

Thr Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr
2810 2815 2820

Pro Val Asn Ser Trp Leu Gly Asn Ile Ile Met Phe Ala Pro Thr
2825 2830 2835

Leu Trp Ala Arg Met Ile Leu Met Thr His Phe Phe Ser Val Leu
2840 2845 2850

Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asn Cys Glu Ile Tyr
2855 2860 2865

Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro Pro Ile Ile
2870 2875 2880

Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser
2885 2890 2895

Pro Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly
2900 2905 2910

Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala Arg Ser Val Arg
2915 2920 2925

Ala Arg Leu Leu Ser Arg Gly Gly Arg Ala Ala Ile Cys Gly Lys
2930 2935 2940

Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro

2945

2950

2955

Ile Ala Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr Ala
2960 2965 2970

Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg
2975 2980 2985

Pro Arg Trp Phe Trp Phe Cys Leu Leu Leu Leu Ala Ala Gly Val
2990 2995 3000

Gly Ile Tyr Leu Leu Pro Asn Arg
3005 3010